Small Business Innovation Research/Small Business Tech Transfer

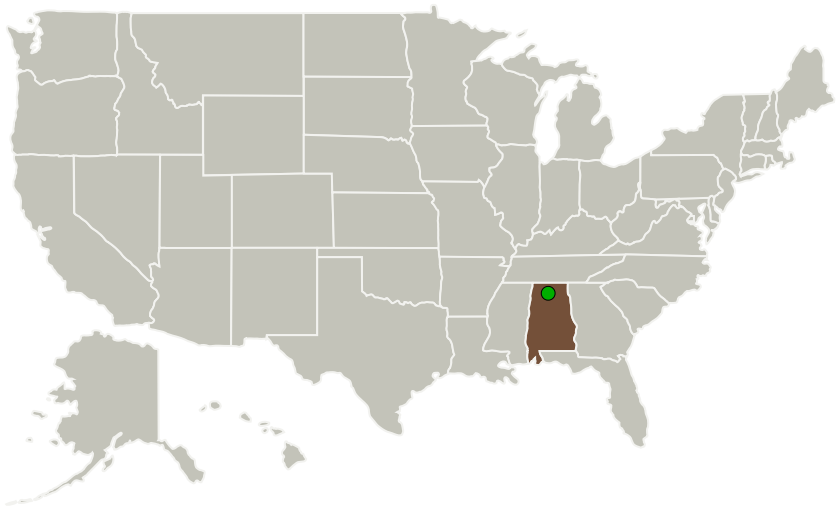
High Chamber Pressure, Light Weight Thrusters, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

The performance liquid propellant engines can be significantly improved by increasing both combustion temperature and pressure and reducing engine weight. State of the art Bi-propellant engines are metallic; the highest temperature combustion chambers are made of iridium/rhenium metals. Utilizing carbon-carbon composites for thrust chamber structures can reduce component weight by as much as 90%. Unfortunately carbon composites suffer from unacceptably high oxidation rates. Lining carbon-carbon chambers with a thin layer of iridium or iridium/rhenium is an innovative way to provide the oxidation barrier necessary to enable the use of carbon-carbon composites. This proposal evaluates using metal-lined carbon-carbon to produce high pressure, light weight thrust chambers.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations
Alabama

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: High Chamber Pressure, Light Weight Thrusters, Phase I P roject Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139046)*

Project Management

Program Director:

Jason L Kessler

Program Manager:

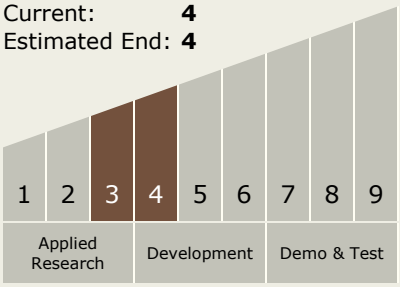
Carlos Torrez

Principal Investigator:

Timothy Mckechnie

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.3 Cryogenic

Target Destinations

Earth, The Moon, Others Inside the Solar System, Outside the Solar System, The Sun, Mars